

Harlequin Duck Surveys, McDonald Creek Area, Glacier National Park, 2004

Prepared for:

Glacier National Park,
West Glacier, Montana

By:

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ABSTRACT

As part of a larger regional effort during 2004, surveys of Harlequin Ducks were conducted during pair season and brood season in Glacier National Park, with special focus on Upper McDonald Creek. In addition, pair surveys were conducted on Fish and Fern creeks near the southwest end of McDonald Lake, and brood surveys on Saint Mary's River, and Reynolds and Paradise creeks east of Logan Pass.

An all-day survey of Upper McDonald Creek on 9 May resulted in a count of 30 Harlequin Ducks (10 pairs and 10 adult males), the largest one-day count of the year. Another pair was present on Fish Creek.

In August brood season, three broods (two with hens) were captured and banded (13 birds total); a fourth brood of seven (with hen) was observed on McDonald Creek several days after the banding operation. Thus, at least four broods of Harlequin Ducks were produced on Upper McDonald Creek in 2004. No birds or broods were seen on Reynolds and Paradise creeks, or Saint Mary's River.

Maximum one-day pair (ten) and total brood counts (four) in 2004 were the largest for Upper McDonald Creek since 1997 and 1992, respectively. These counts contrasted with Harlequin Duck productivity on the four monitored Lower Clark Fork streams in the Noxon area, which apparently produced only two broods in 2004 (the eight-year average from 1992-1999 was 4.6 broods). Thus it appears that "good" years and "bad" years for Harlequin Ducks are not necessarily synchronized across northwestern Montana. McDonald Creek continues to be an important Montana breeding stream for Harlequin Ducks.

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INTRODUCTION

The Harlequin Duck (*Histrionicus histrionicus*) is a small sea duck, which travels inland to breed on fresh water streams (Robertson and Goudie 1999). Approximately 150-200 pairs of Harlequins currently breed in Montana (Reichel et al. 1997), with most located in the following areas: 1) tributaries of the lower Clark Fork River; 2) tributaries of the North, Middle, and South Forks of the Flathead River; 3) streams coming off the east front of the Rocky Mountains; and 4) the Boulder River.

Most ducks arrive on their inland breeding areas in mid-April to early-May; unmated males typically arrive before pairs (Kuchel 1977). The males return to the coast shortly after the females begin incubation; most are gone by early July (Kuchel 1977). The females and young remain on the streams until August or early September. This chronology is influenced by elevation and by the timing of spring runoff; it may vary up to several weeks between years.

The Harlequin Duck is listed as “Sensitive” by the U.S. Forest Service, Region 1 and as an Animal Species of Concern by the Montana Natural Heritage Program/Montana Fish, Wildlife & Parks (Montana Natural Heritage Program 2004).

The Montana Natural Heritage Program began banding Harlequin Ducks to a limited extent in 1991. Through 1999, a total of 391 Harlequin Ducks were marked on 9 streams, representing the largest marked “population” from the breeding streams (Hendricks 2000). Birds marked in Montana have subsequently been captured and observed on the coasts of Oregon, Washington and British Columbia, with most reports coming from Vancouver Island (Reichel et al. 1997, Hendricks 2000).

Objectives for the 2004 season included 1) surveying the Lower Clark Fork streams (Rock Creek, Marten Creek, Swamp Creek, Vermilion River) of Sanders County for presence and status of Harlequin Ducks, 2) gathering duck productivity data on the Lower Clark Fork streams, 3) marking as many individuals as possible on these streams for long-term monitoring, and 4) surveying McDonald Creek in Glacier National Park, the only other population in Montana with survey data comparable to the Lower Clark Fork population.

This report focuses on Glacier National Park by summarizing results from the 2004 field season, and should not be considered a comprehensive analysis of all data collected from previous years (although some of the older data are presented for context). A larger report will be developed early in 2005 summarizing recent survey and monitoring data on Harlequin Duck since 1999. For a recent and relatively comprehensive summary of Harlequin Duck research in Montana through 1999 see Hendricks (2000).

METHODS

As part of a broader regional survey during 2004 of Harlequin Ducks in northwestern Montana, Heritage zoologists, with support and assistance from NPS personnel, conducted May pair surveys and late-July and August brood surveys in Glacier National Park, with special attention to Upper McDonald Creek. In addition, pair surveys were conducted on Fish and Fern creeks near the southwest end of McDonald Lake, and brood surveys on St. Mary's River, and Reynolds and Paradise creeks east of Logan Pass.

Surveys in 2004 were conducted by walking the stream channel (when possible) or stream bank. In most cases, the surveyor walked upstream, giving more time to observe the bird before it moved out of sight; in cases where birds were not to be marked, the surveyor made a loop around the birds to minimize disturbance. We attempted to capture and mark all birds seen when a licensed, qualified bird-bander was present on the survey, and when the conditions were considered safe for banding. Park personnel monitored Upper McDonald Creek between McDonald Lake and Logan Creek both before and after Heritage personnel participated in pair and brood surveys (see Richards and Edmonds 2004).

Captured birds were sexed, aged, weighed, measured (wing cord and tail), marked, and released. Juveniles were aged based on feather development: Class IA-C: downy (1-14 days old), no feathers visible; Class IIA-C: partly feathered (15-35 days old); Class III: fully feathered but flightless (36-51 days old). Birds were banded with a USFWS aluminum band and with a blue, plastic leg band with 2 white alpha alpha (juveniles) or alpha numeric (adults) characters. These birds are individually recognizable by the imprinted characters. Dates, locations, distance surveyed, and general characteristics of the stream reaches surveyed were recorded; location, number, age, and sex of all Harlequin Ducks seen were recorded, as were habitat characteristics of the sites where ducks were first observed. All surveys and duck observations were entered into a database and associated ARC-INFO coverages in the Heritage Biotics databases.

RESULTS

Pair Surveys: An all-day survey of Upper McDonald Creek on 9 May, from McDonald Lake to Logan Creek, resulted in a count of 30 Harlequin Ducks (10 pairs and 10 adult males). Another pair was present on Fish Creek on 10 May; no birds were encountered on Fern Creek the same day. May and June counts on McDonald Creek subsequent to 9 May resulted in fewer pairs and total birds observed. We did not attempt to band adults in May because it was deemed too hazardous (high water) for the inexperienced crew to set nets and capture birds without fear of possible trap mortality.

Brood Surveys: A brood survey of Upper McDonald Creek on 31 July, from Logan Creek to Mineral Creek where one or two broods are often seen, resulted in no birds, even though Mineral Creek had essentially no surface flow by this date. No birds were seen on Reynolds and Paradise creeks, and Saint Mary's River during surveys on 4 and 5 August.

A brood of 3 ducklings had been observed previously on McDonald Creek (on 28 July) near Sacred Dancing Cascade, and the nesting season was obviously advanced elsewhere in the region, so the lack of birds on 31 July on McDonald Creek above Logan Creek was unexpected. A survey on 30 July of Trail Creek, just outside the northwestern Park boundary in the North Fork Flathead River drainage, resulted in 11 birds (two broods of 3 and 6 II-B or II-C ducklings, respectively, plus their hens). Two broods of 6 and 4 II-B or II-C ducklings (plus their hens) were found on Rock Creek (Lower Clark Fork area near Noxon) on 27 July, indicating the nesting season was generally far enough advanced for brood surveys and banding.

On-going monitoring of McDonald Creek by Park personnel revealed the appearance of multiple broods by 11 August. On 20 August, three broods (of 3, 5, and 3 Class III or flying juveniles) plus two hens were captured on the lower reaches of the creek and banded (Table 1). Continued monitoring of McDonald Creek resulted in an additional brood of 7 (with hen) on 25 August, none of which were banded at the time they were observed. Thus, at least four broods of Harlequin Ducks were produced on Upper McDonald Creek in 2004. The three broods we banded on 20 August, plus the fourth unbanded brood observed on 25 August, are probably the same broods documented during the 11 August survey (see Richards and Edmonds 2004).

Table 1. Harlequin Ducks captured and banded on Upper McDonald Creek on 20 August 2004. All color bands are blue with white alpha-alpha (juvenile) or alpha-numeric (adult) codes.

Aluminum Band No.	Color Band Code	Sex^a	Age^b	Weight (g)	Wing Chord (mm)	Tail Length (mm)
Brood 1						
925-72618	GR	U	FJ	580	169	78
925-72619	G6	F	ASY	620	181	78
925-72620	GT	U	FJ	560	171	71
925-72624	GS	U	FJ	540	162	67
Brood 2						
925-72625	GW	F	III	450	155	72
925-72626	GV	M	III	520	156	75
925-72627	GZ	M	III	540	157	77
925-72628	GY	M	III	530	160	74
925-72629	GX	F	III	510	151	75
Brood 3						
925-72630	G7	F	ASY	600	195	77
925-72631	BA	M	FJ	560	181	73
925-72632	BX	F	FJ	490	176	68
925-72633	BJ	F	FJ	470	168	68

^a F = female, U = undetermined.

^b III = juvenile fully feathered but flightless, FJ = flying juvenile, ASY = after second year adult

DISCUSSION

Maximum one-day pair count (ten) and total brood count (four) in 2004 were the largest for Upper McDonald Creek since 1997 and 1992, respectively (Richards and Edmonds 2004). The brood counts in 2004 on McDonald Creek are more encouraging for Harlequin Duck productivity in Montana than those on the four monitored Lower Clark Fork streams in the Noxon area, which apparently produced only two broods in 2004 (the eight-year average for the period 1992-1999 was 4.6 broods; Hendricks 2000). Thus it seems that “good” years and “bad” years for Harlequin Ducks are not necessarily synchronized across northwestern Montana.

McDonald Creek continues to be an important breeding stream in Montana for Harlequin Ducks. Stream flow levels are maintained through the brood season at levels sufficient over much of the full reach of Upper McDonald Creek to be utilized by ducks until ducklings are old enough to move downstream and disperse. In contrast, tributary streams of the Lower Clark Fork River near Noxon and Trout Creek often experience August water levels so low that the beds go dry in some areas where breeding by Harlequin Ducks appears to occur (personal observation). Low water levels may make Harlequin broods more susceptible to predation, and may reduce available food levels to the point where deleterious effects are apparent on duckling survival. Thus, the available time-series data suggest that McDonald Creek may be more reliable Harlequin Duck breeding habitat, whereas Harlequins breeding on the streams in the Noxon area are exposing themselves to marginal habitat in some years.

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